

## **3.1 Description of Zone 7 Groundwater Basin**

### **3.1.1 Overview**

The Livermore Valley, an east-west trending, inland structural basin located in northeastern Alameda County, is surrounded primarily by north-south trending faults and hills of the Diablo Range. The valley covers about 42,000 acres, extends approximately 14 miles in an east-west direction and varies from 3 to 6 miles in width. It is separated from San Francisco Bay by several northwesterly trending ridges of the California Coast Ranges, including the Pleasanton Ridge. The valley floor slopes gently west and southwest from an elevation of approximately 700 feet above sea level in the east to approximately 320 feet above sea level in the southwest.

The Livermore Valley Watershed covers more than 400 square miles (250,000 acres) and extends north almost to Mt Diablo and south almost to Mt Hamilton. Six principal streams flow into and/or through the valley, and join in the southeast where the Arroyo de Laguna flows out of the valley. The other five arroyos, namely the Arroyo Valle, Arroyo Mocho, Arroyo Las Positas, Tassajara Creek, and Alamo Creek, are essentially tributaries to the Arroyo de Laguna. Average precipitation rates range from 16 inches per year at the valley floor to over 20 inches per year in the southeast and northwest portions of the valley.

The Livermore-Amador Valley Groundwater Basin is located in the heart of the Livermore Valley and watershed and extends south into the hills south of Pleasanton and Livermore. It includes 65,000 acres occupied by both the Livermore Valley (42,000 acres) and the Livermore uplands (23,000 acres). The Basin is designated DWR 2-10 in Bulletin 118 and includes the areas occupied by both Livermore Valley and Livermore uplands (see Figure 3-1).

The Main Basin is bounded on the:

- west by northwesterly trending ridges of the California Coast Ranges (including Pleasanton Ridge) and the Calaveras fault,
- north by the Tassajara Uplands and the steeply dipping east west trending Tassajara Formation,

- east by the Greenville Fault and by the marine formations exposed in the Altamont Hills, and
- south by the Verona Fault and Livermore Uplands and the steeper Livermore Highlands.

The Main Basin (described in more detail in the following subsections) is a portion of the Livermore-Amador Groundwater Basin (DWR 2-10). The Main Basin covers 17,000 acres and contains the highest yielding aquifers and best quality water within the DWR Basin 2-10.

### 3.1.2 Hydrogeology

Structural uplift of the entire Coast Ranges occurred during the late middle Pliocene and Pleistocene, causing extensive folding and faulting of the region. The Livermore Valley, a structural valley, formed by a faulted asymmetric syncline, was created as a result of downwarping of the Miocene-Pliocene sandstones and conglomerates between the western bordering Calaveras Fault and the eastern bordering Greenville Fault. Continued deposition, uplift, and faulting have led to the current Livermore Valley stratigraphy.<sup>1</sup>

The valley is partially filled with Pleistocene-Holocene age (recent alluvium) alluvial fan, stream and lake deposits, which range in thickness from a few feet along the margins to nearly 400 (and possibly 800) feet in the west-central portion. The alluvium consists of unconsolidated gravel, sand, silt, and clay. The southern region of the Livermore Valley, the most important groundwater recharge area, consists mainly of sand and gravel that was deposited by the ancestral and present Arroyo Valle and Arroyo Mocho.

The eastern and northern regions of the valley contain thinner deposits and consist of alternating layers of gravel, sand, silt, and clay that are laterally discontinuous and resulted from the deposition of smaller streams. The western region of the valley has extensive gravel layers alternating with thick clay beds totaling approximately 400 feet in thickness. The alternation of sand/gravel layers and silt/clay layers form the basic aquifers for the area.<sup>2</sup>

In general, multiple aquifers are recognized in the alluvium of the Livermore Valley. The alluvium increases in thickness from east to west across the basin and thins both north and south at its boundaries. The alluvium also thickens from north to south to the central portion of the groundwater basin and then thins from the center toward the south. Although the upper portions of the alluvium appear to be very thick and continuous in the middle of the basin, the deeper aquifers are often discontinuous and/or poorly interconnected.

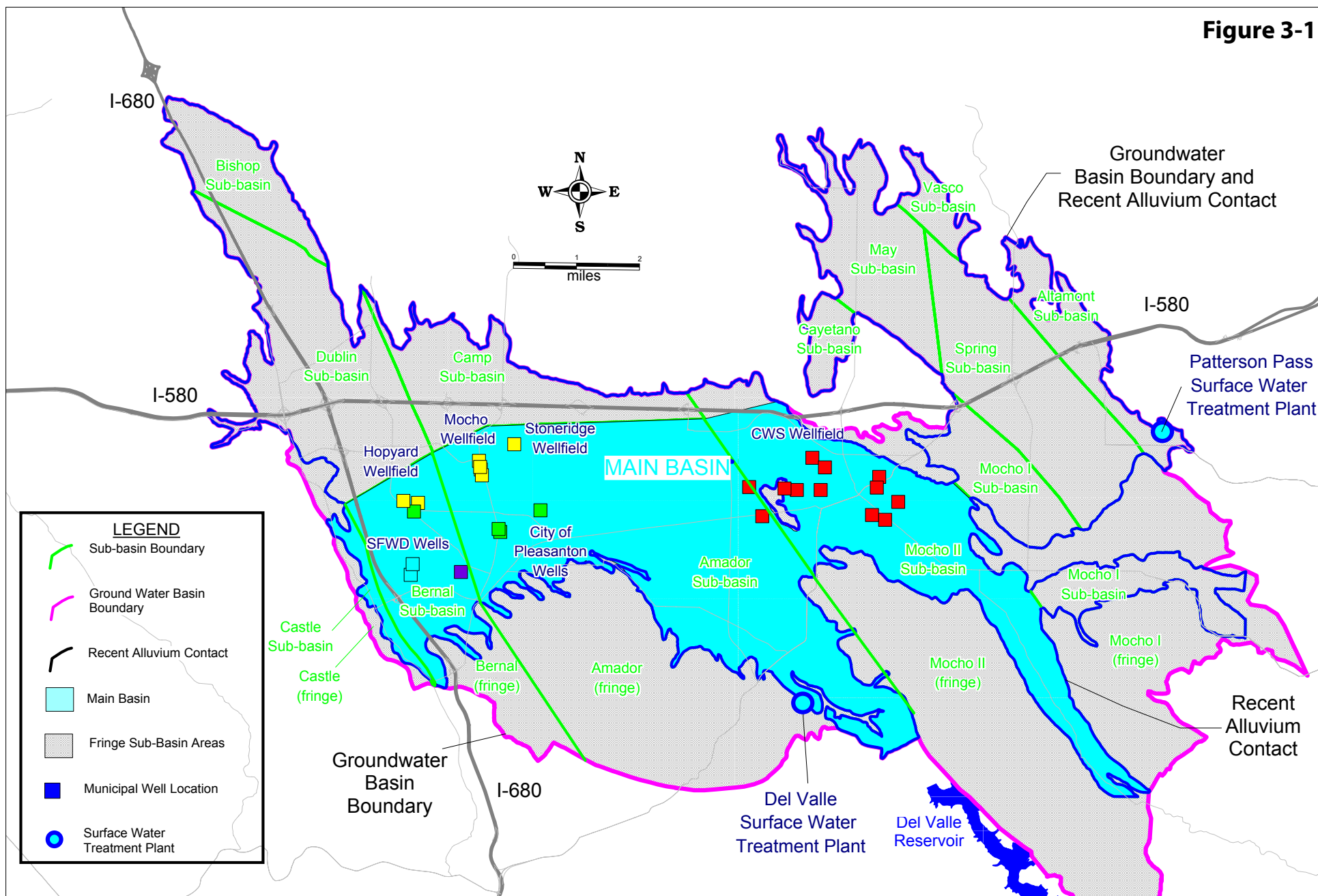
The Livermore Formation consists of beds of clayey gravels and sands, silt, and clay that are unconsolidated to semi-consolidated and estimated to be 4,000 feet

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<sup>1</sup> California Department of Water Resources 1964b, 1974; Crane 1988; Hall 1958.

<sup>2</sup> California Department of Water Resources 1966, 1974, and Zone 7.

**Figure 3-1**



**ZONE 7 WATER AGENCY**  
100 NORTH CANYONS PKWY, LIVERMORE, CA 94551

DRAWN	GERALD GATES TOM ROOZE
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## GROUNDWATER BASIN MAP

Groundwater Annual Monitoring Report

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thick in the southern and western portion of the basin.<sup>3</sup> These sediments display lower yields in the upland areas. Groundwater from this formation is sodium bicarbonate in nature and of moderately good quality. Minor amounts of groundwater are believed to move along the strike of the beds to the northwest and enter the Main Basin (see detailed description below) at the southern portions of the Bernal and Amador sub-basins.

The Tassajara and Green Valley Formations, located in uplands north of the valley, are roughly Pliocene in age and were deposited under both brackish and freshwater conditions. They basically consist of sandstone, tuffaceous sandstone/siltstone, conglomerate, shale, and limestone. Water movement from these formations to the Main Basin is precluded by either structural alteration where beds dip away from the general groundwater flow of the valley or by non-water bearing stringers (tuff and clay particles). The near-vertical structural dip of the Tassajara and Green Valley formations is believed to prevent the commingling of waters among these formations and the alluvium, essentially cutting this water off from the groundwater basin.<sup>4</sup> Groundwater from these formations is sodium bicarbonate in nature and of moderately good quality.

### 3.1.3 Aquifer Zones

Within the groundwater basin, there is often a difference in water level fluctuations and water quality with depth. This difference is attributable to the existence of multiple aquifers that are poorly interconnected. Although multiple aquifers have been identified, wells have been classified generally as being in one of two aquifer zones, primarily to simplify the description of this complex basin:

- **Upper Aquifer Zone**—The upper aquifer zone consists of alluvial materials, including primarily sandy gravel and sandy clayey gravels. These gravels are usually encountered underneath the surficial clays (typically 20 to 40 feet below ground surface [bgs]) to about 80–150 feet bgs. This aquifer extends throughout the majority of the groundwater basin. Groundwater in this zone is generally unconfined. In the center portion of the groundwater basin, the upper aquifer is underlain by a relatively continuous, silty clay aquiclude up to 50 feet thick which is underlain by the Lower Aquifer Zone. In the eastern portion of the groundwater basin, the Livermore Formation underlies the upper aquifer. In the Zone 7 groundwater model, the Upper Aquifer Zone is referred to as Layer 1.
- **Lower Aquifer Zone**—Because of a lack of detailed hydrostratigraphic evaluation, all materials encountered below the clay aquiclude/aquitard in the center portion of the basin have been known collectively as the Lower Aquifer Zone. The aquifer materials consist of semi-confined to confined, leaky, coarse-grained, water-bearing units interbedded with relatively impermeable, fine-grained units. Based on localized hydrostratigraphic evaluation in the vicinity of Zone 7 well fields and as additional geologic

<sup>3</sup> California Department of Water Resources 1964b.

<sup>4</sup> California Department of Water Resources 1966, 1974; Zone 7 files.

information and hydrologic data become available, it is possible that this zone can be further subdivided into more laterally extensive, distinct hydrostratigraphic units. Currently the Zone 7 groundwater model groups the entire lower aquifer zone into Layer 3, with the aquiclude/aquitard zone as Layer 2.

### 3.1.4 Main Basin

The groundwater basin has been divided into two major parts based on importance. For the past 20 years the term *Main Basin* has been used for that portion of the groundwater basin covering the 17,000 acres that contain the highest-yielding aquifers and best quality water within the Livermore-Amador Valley Groundwater Basin. The less important area is called the fringe basin. The Main Basin is located in the central and southwestern portion of the groundwater basin. This area has a much larger capacity than the surrounding areas to store and convey groundwater, particularly in the lower zone. Since the early 1900s, this area has been very significant for the local groundwater supply. Between about 1980 and 1988, this area was called the central basin. Since 1988, the central basin, except for the eastern portion of Livermore, has been referred to as the Main Basin (see Figure 3-1).

Several subsurface barriers to lateral groundwater movement form the boundaries of the Main Basin. Observations and investigations by Zone 7 and others continue to confirm the existence of these groundwater barriers. Faults are the major structural features known to have marked effects on the movement of groundwater in this region. Faults in this region tend to act as barriers to the lateral movement of groundwater.

The Main Basin is comprised of the Castle, Bernal, Amador and Mocho II Sub-Basins and is bounded on the:

- north by the Parks Boundary (which was initially considered to be fault-related, but may actually be a depositional boundary between recent alluvium and older material);
- east by shallow bedrock separating Mocho I from Mocho II sub-basins;
- south by shallow bedrock and the Livermore Uplands; and
- west by the Coastal Ranges and the Calaveras Fault.

Particular Sub-Basin boundaries and features are shown on Figure 3-1 and described in more detail, below.

The portion of the groundwater basin that is outside the Main Basin is called the fringe basin. The majority of the connectivity between the fringe and Main Basins is through the Upper Aquifer Zone. Subsurface inflow from the Lower Aquifer Zone is considered negligible.

## **3.1.5 Main Basin Sub-Basins**

### **3.1.5.1 Castle Sub-Basin**

The Castle sub-basin is a thin strip that extends along the southwestern portion of the Main Basin. It is bounded to the south, west, and north by marine sediments of the Coastal Range and to the east by the Calaveras Fault. While usually included in the Main Basin, this sub-basin is not used for municipal groundwater production. Only small production wells are located in this area. Water occurs in both shallow valley fill sediments and the Livermore Formation. The water from the Livermore Formation is of a sodium bicarbonate nature. This sub-basin functions as a westward extension of the Bernal sub-basin.

### **3.1.5.2 Bernal Sub-Basin**

The Bernal sub-basin is located in the southwestern portion of the groundwater basin and is bounded to the west by branches of the Calaveras Fault, to the east by the Pleasanton Fault, to the north by the Parks Boundary, and to the south in part by contact with non-water-bearing formations and partly by contact with the Verona Fault. Both unconfined and confined aquifers exist in the water-bearing sediments. Waters from the northern and central portions of this sub-basin are of fair to excellent quality. However, much of the upper aquifer water has high TDS exceeding 600 mg/l. The water from the northern and southern portions of the sub-basin are of sodium bicarbonate nature, while the central portion is of the magnesium bicarbonate type and the western and south-central portions are of calcium bicarbonate character.

The area overlying the Bernal sub-basin is the point of convergence for all major streams that drain the Livermore Valley. The area overlying the sub-basin is subsequently drained by the Arroyo de la Laguna. Like surface water, groundwater also historically converges in this sub-basin, which allows for the mixing of the dominant cations of sodium, magnesium, and calcium.

The Quaternary alluvium is estimated to have a thickness of at least 800 feet in this sub-basin and overlies the Livermore Formation. Well production (primarily by Zone 7) in this sub-basin currently ranges up to 3,500 gallons per minute (gpm), and specific capacities range from 3 to 260 gpm per foot of drawdown. Other basin pumpers include the City of Pleasanton (although much of City of Pleasanton's pumping has shifted to the West Amador sub-basin, discussed below), San Francisco PUC (supplying the Castlewood area) and the Alameda County Fairgrounds. Historically, this Sub-Basin was overdrafted but has since been partially refilled and is used less for regional supply due to Zone 7's groundwater management efforts, including the importation of surface water from the SWP.

### 3.1.5.3 Amador Sub-Basin

The Amador sub-basin is located in the west central portion of the groundwater basin and is bounded to the west by the Pleasanton Fault, to the east by the Livermore Fault, to the north by a permeability barrier of inter-fingering of alluvial deposits and partly by the Parks Boundary, and to the south by the drainage divide and partly by contact with non-water-bearing formations. This sub-basin is host to the majority of high production wells and has both unconfined and confined aquifers. Waters from this sub-basin are of good to excellent quality, characterized by sodium bicarbonate, magnesium bicarbonate, and calcium bicarbonate with few instances of elevated levels of boron and nitrate.

This sub-basin of Quaternary alluvium has a maximum thickness of approximately 800 feet and overlies the Livermore Formation, which may be up to 4,000 feet thick. Well production (primarily by Zone 7 and the City of Pleasanton) in this sub-basin ranges from 42 to 2,820 gpm and specific capacities of 1.1 to 217 gpm per foot of drawdown.

### 3.1.5.4 Mocho II Sub-Basin

The Mocho sub-basin has been divided into two distinct areas, Mocho I and Mocho II, by a line of very low hills thought to be exposures of the Livermore Formation. The basins are further distinguished by a change in aquifer characteristics from a sodium bicarbonate (Mocho I) to a magnesium bicarbonate water type (Mocho II).

Of the entire Mocho sub-basin, only a portion of the Mocho II sub-basin is in the Main Basin. This portion of the Mocho II sub-basin is located in the east central portion of the groundwater basin and is bounded to the west by the Livermore Fault, to the east by thinning young alluvium and exposed Livermore Formation, to the north by the Tassajara Formation that is not hydraulically connected to the sub-basin and the Parks Boundary, and to the south by the Livermore Uplands and contact with non-water-bearing marine formations.

Both unconfined and confined aquifers exist in the water-bearing sediments. Waters from this sub-basin are of fair to excellent quality sodium bicarbonate (Mocho I) and magnesium bicarbonate character (Mocho II), with some instances of elevated boron and sodium ions.

The recent alluvium ranges in thickness from approximately 10–50 feet in Mocho I and up to 150 feet in Mocho II. In both sub-basins the alluvium overlies the Livermore Formation, both conformably and unconformably. The silty/clayey overburden is mostly missing. The Upper Aquifer is exposed at the surface in much of the area. Mocho I and Mocho II appear to be hydraulically connected only in the shallow alluvial deposits. Well production in this sub-basin (primarily by CWS) ranges up to 950 gpm with specific capacities of 2 to 50 gpm per foot of drawdown.

## 3.2 Groundwater Levels and Storage

Historically, much of the Main Basin experienced artesian conditions. In the late 1800s, the pre-development groundwater levels in the basin created a gradient, causing groundwater to flow from east to west and naturally exit the basin as surface flow in the Arroyo de la Laguna. In the early and mid-1900s, groundwater began to be extracted in appreciable quantities, causing groundwater levels to drop throughout the basin. As a result, groundwater levels dropped below the point where groundwater would naturally rise into Arroyo de la Laguna and exit the basin via streamflow.<sup>5</sup> Water levels continued to drop in the Main Basin through the 1960s. The trend began to reverse in 1962 when Zone 7 Water Agency began importing water from the State Water Project (SWP) and later in the 1960s when Zone 7 began capturing and storing local runoff in Lake Del Valle. The first imports were utilized in an off-stream recharge facility called Las Positas Pit. This facility was operated from 1962 until the late 1970s and again, briefly, in the 1980s.

Thus, after experiencing historical groundwater lows in the 1960s (see Figure 3-2), Main Basin water levels stabilized in the late 1960s and started to rise in the early 1970s with the advent of regional groundwater management programs. Groundwater levels approached the “historic low” again during the 1977 and 1987–1992 droughts, although 1992 water levels in many monitoring wells were significantly below the previous historic lows of the 1960s.

Today groundwater in both aquifer zones generally follows a westerly flow pattern, like the surface water streams, along the structural central axis of the valley toward municipal pumping centers. The majority of subsurface inflow, however, occurs across the northern boundaries of the Main Basin—in particular the Dublin and western Camp sub-basins—and flows in a southerly direction.<sup>6</sup> These sources of groundwater commingle in the Bernal and Amador sub-basins and have a general flow toward municipal or gravel mining company groundwater pumping wells or pits.<sup>7</sup>

The relatively low hydraulic conductivity of the aquitard layers impedes the vertical movement of groundwater between the Upper and Lower Aquifer Zones. The exchange between the two aquifers, as indicated by the groundwater monitoring data, varies depending upon the thickness and permeability of the separating aquitard and the potential gradient. Even though the movement of water and salts from the upper aquifer to the lower aquifer is slow, it is still the major sources of recharge to the lower aquifer.<sup>8</sup>

The Main Basin has a storage capacity of more than 250,000 acre-feet. The Main Basin was full in early 1900 and full again in 1983. Groundwater has been withdrawn down to historical low storage in 1962 and 1966 with an estimated remaining storage of 128,000 acre-feet. (Groundwater levels approached the

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<sup>5</sup> Zone 7 2004b.

<sup>6</sup> Zone 7 2004b.

<sup>7</sup> Zone 7 2004b.

<sup>8</sup> Zone 7 2004b.



“historic low” in some parts of the basin during the droughts of 1977 and 1987–1992.) In 1987, Zone 7 adopted a Groundwater Management Policy (see Appendix E) that included maintaining groundwater levels high enough to provide emergency reserves adequate for the worst credible drought. For planning purposes, Zone 7 maintains this reserve above historical lows. The remaining half of the groundwater (that portion above historical lows) is actively managed for supply reliability and is used for water supply storage, and recovery during times of drought or emergency.<sup>9</sup> In 2002, as part of the development of Zone 7’s Well Master Plan, Zone 7 further defined “historic lows” as a piezometric surface used to manage groundwater levels.

### 3.3 Groundwater Recharge

Management of groundwater recharge involves both quantity and quality aspects. The annual average natural recharge into the groundwater basin is approximately 13,400 af/y. Zone 7 artificially recharges the basin with additional surface water supplies by releasing water into the Arroyo Mocho and Arroyo Valle. The existing artificial recharge capacity ranges from 12,300 af/y to 20,000 af/y. In years when the streams are dry, there is more capacity. Adding artificial recharge essentially doubles the natural yield of the basin.<sup>10</sup> In addition, Zone 7 actively monitors the quality of water at many of the key stream recharge areas to ensure the protection of the quality of both surface and ground water.

Groundwater recharge from streams has the following components:

- natural recharge—rain runoff into streams,
- artificial recharge—releases from the SBA or Lake Del Valle into recharge streams, and
- gravel mining recharge—recharge from gravel mining pits or discharges into the streams.

Figure 3-3 shows the relative groundwater recharge capacity associated with each major stream in the watershed and the associated water quality (represented as concentration of TDS in mg/l). Note that the dashed lines represent areas of rising groundwater rather than areas of stream recharge. TDS in the local surface water varies significantly throughout the watershed from approximately 350 mg/l TDS to more than 1,000 mg/l. The highest quality surface water recharging the basin occurs through Arroyo Mocho and Arroyo Valle where the TDS is generally less than 500 mg/l. The poorest quality surface water recharging the basin has a TDS of approximately 1,000 mg/l and occurs in Arroyo Las Positas. On average, given 1997 land use conditions, approximately 2,700 af/y of natural recharge occurs via Arroyo Mocho, 1,200 af/y via Arroyo Las Positas, and 2,700 af/y via Arroyo Valle.

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<sup>9</sup> Zone 7 2004b.

<sup>10</sup> Salt Management Plan 2004a.

**Figure 3-2**

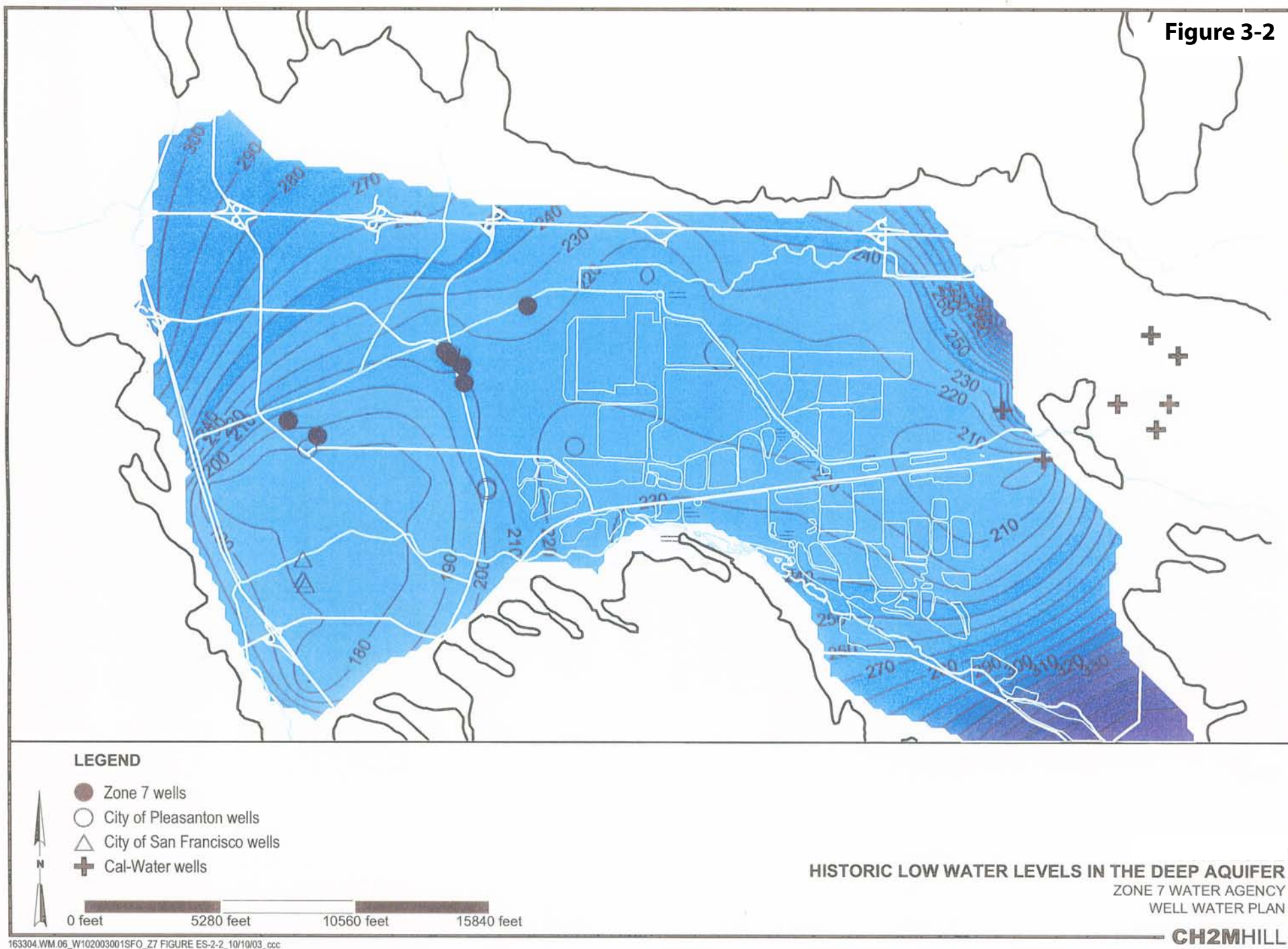
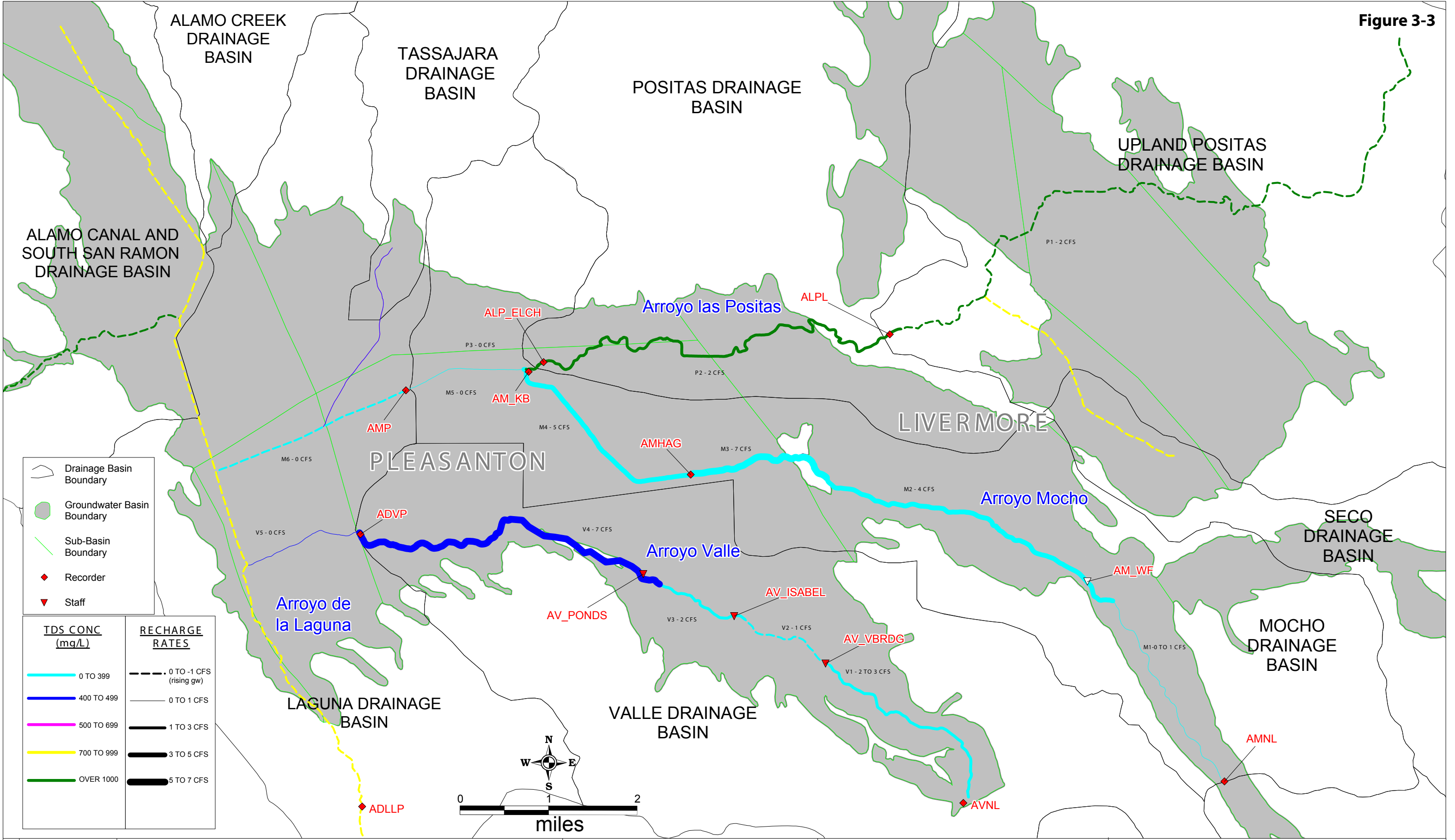


Figure 3-3



**ZONE 7 WATER AGENCY**  
100 NORTH CANYONS PKWY, LIVERMORE, CA 94551

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Apr 7, 2005

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**WATER RESOURCES ENGINEERING**  
**STREAM RECHARGE RATES AND TDS**

The Proposed Chain of Lakes Recharge Project will provide benefits by creating additional surface water storage and recharge capacity. This is a long-term project that involves Zone 7 acquisition of quarry pits dug by local mining companies. These former mining pits, as they get turned over to Zone 7, are incorporated into the regional water management programs. During wet weather, potentially low-cost, low-TDS surface water and/or runoff could be purchased/captured and stored/ recharged for future treated or untreated supply. Demineralized recycled water could potentially be stored in the Chain of Lakes area. The first two former mining pits, Lake-H and Lake-I, became available in May 2003. Plans for a diversion structure (to divert water from the stream into the Chain of Lakes) are still needed and are not anticipated to be completed until 2008. The complete Chain of Lakes (all nine lakes) will not be available until about 2030.

## 3.4 Water Use

Zone 7 monitors water usage to ensure that sufficient supply and adequate quality is delivered to all its water retailers. Stored water pumped from the groundwater basin (resulting from the artificial recharge program discussed above) is a critical component of Zone 7's water supply. On average, 25% of the potable water produced by Zone 7 is this groundwater supply. However, including pumping by other entities, on the average, over 35% of Valley-Wide potable water is from the groundwater basin. A conceptual diagram of the Livermore-Amador Valley water supply and use is included in Figure 3-4. This figure demonstrates how Zone 7's water sources are integrated with other pumping to meet regional water demands.

In addition to Zone 7's groundwater pumping (about 12,000 af/y), groundwater extractions from the basin include:

- Evaporative losses of mining water from the gravel pits (~3,000 af/average year);
- municipal pumpage (~7,200 af/y) by several retailers;
- private pumpage (Fairgrounds, San Francisco Public Utilities Commission [SFPUC], industrial supply, domestic supply, others, ~1,200 af/y); and
- agricultural pumpage for irrigation (~500 af/y);

## 3.5 Groundwater Quality

In general, groundwater quality throughout most of the Main Basin is suitable for most types of urban and agriculture uses with some minor localized water quality degradation. The primary constituents of concern are high TDS (or hardness), nitrate, boron, and organic compounds.<sup>11</sup> In the western Main Basin,

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<sup>11</sup> California Department of Water Resources 2003.

groundwater is a calcium-magnesium-bicarbonate water type and has historically been considered “hard.” The rising salinity is associated with several factors (see Section 4.6.5, Salt Balance) but is primarily associated with the saline fringe basin shallow groundwater flowing into the basin or flowing into recharging streams. Imported water brings additional salts into the basin some of which are left in the soil as evapotranspiration occurs (subsequent leaching with rain or further application of irrigation water transports salts to the groundwater table). Increased salinity attributable to irrigation in a semi-arid region is another major issue (see Salt Balance Section).

Trace amounts of boron are present in the eastern fringe basins (associated with marine formations) and with shallow groundwater in the northern fringe basins. High boron levels and lower yields can limit the use of some fringe basins for extensive agricultural irrigation.<sup>12</sup> Zone 7 monitors all the wells in its groundwater quality monitoring program for major minerals and select metals, including boron. Water quality samples are analyzed by the Zone 7 Water Quality Laboratory located at the Del Valle Water Treatment Plant.

The northern extent of the Livermore-Amador Valley is dominated by a sodium-rich water, while much of the western part of the basin near Pleasanton has a magnesium-sodium characteristic (i.e., both magnesium and sodium are dominant cations). The area along the eastern portion of the basin, beneath the Livermore area, has magnesium as the predominant cation.<sup>13</sup> Local impairments include some areas with boron concentrations exceeding 2 mg/l.

Nitrates have also impaired portions of the Main Basin, especially in the east. Nitrate levels between 30 and 65 mg/l have been identified in the nitrate study area, which covers an area of 670 acres of unincorporated residential and agricultural land in the South Livermore area. Nitrates from in-Basin wastewater disposal (less common since 1980) contributed to this problem historically. This issue is discussed in more detail in Section 5.1.4.4, Wastewater Management.

Releases of fuel hydrocarbons from leaking underground storage tanks and spills of organic solvents at industrial sites have caused minor-to-significant groundwater impacts in specific parts of the region. Detailed discussion is presented in Section 5.1.4.5. Zone 7 participated in the development of the GAMA project, which analyzed water from municipal wells for volatile organic compounds (VOCs) at ultra-low levels not detectable by standard laboratory analysis. The results showed that very low levels of MTBE and other gasoline components were detected in a handful of wells. There are five fuel contamination sites within 2,000 feet of a municipal supply well that are being closely monitored. Proactive cooperation with regulatory agencies on prevention, early detection and site cleanup is helping to protect the basin from fuel contamination (additional information on the Toxic Site Program is presented in Section 5.1.4.5, Toxic Site Management).

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<sup>12</sup> California Department of Water Resources 2003.

<sup>13</sup> California Department of Water Resources 2003.





Chlorinated organic solvent releases to soil and groundwater are an issue in the region,<sup>14</sup> primarily in fringe basins and in upper aquifers. Again, detailed description is provided in Section 5.1.4.5. Cleanup programs at LLNL are in place to remediate this large superfund site from a 50-year-old plume associated with World War II activities. Zone 7 assisted LLNL during the initial year of cleanup and has been working cooperatively with them since. During the past decade LLNL has been providing valuable assistance to Zone 7 in the monitoring and analysis of groundwater conditions within the basin. The GAMA project and the Geotracker project have made significant contributions to groundwater basin monitoring and to the groundwater protection effort. The GAMA project detected tetrachloroethene (PCE), a chlorinated solvent commonly used in dry cleaning, in nine of the 12 municipal wells tested in Livermore. Two of these wells have PCE levels detectable by standard laboratory procedures. The water from these two wells is currently either blended with clean water or treated at the well head to reduce the levels of PCE. One supply well at the Alameda County Fairgrounds in Pleasanton has been impacted by PCE. The water from this well is treated to remove the PCE prior to use.

Zone 7 samples approximately 250 wells under the groundwater quality monitoring program (described in Chapter 4) and reviews results from site cleanup projects made available through Geotracker and from cleanup reports routinely sent to Zone 7 for review (again, additional information on the Toxic Site Program is presented in Section 5.1.4.5, Toxic Site Management).

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<sup>14</sup> California Department of Water Resources 2003.